he research described in this report was sponsored by the ffice of the Secretary of Defense (OSD), under RAND's ational Defense Research Institute, a federally funded esearch and development center supported by the OSD, the oint Staff, and the defense agencies, Contract DASW01-95-C-059.

Library of Congress Cataloging in Publication Data

Long-term economic and military trends 1994–2015 : the United States and Asia / Charles Wolf, Jr. ... [et al.].
p. cm.
"MR-627-OSD."
"Prepared for the Office of the Secretary of Defense."
ISBN 0-8330-2328-4
1. National security—Economic aspects—Asia. 2. National security—Economic aspects—United States. 3. Asia—Armed Forces—Appropriations and expenditures. 4. United States—Armed Forces—Appropriations and expenditures. I. Wolf, Charles, 1924–
HC415.D4L66 1995
338.4'76233'095—dc20 95-30019
CIP

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Published 1995 by RAND
700 Main Street, P.O. Box 2138, Santa Monica, CA 90407-2138
RAND URL: http://www.rand.org/
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Long-Term Economic and Military Trends 1994–2015

The United States and Asia

Charles Wolf, Jr., K. C. Yeh, Anil Bamezai, Donald P. Henry, Michael Kennedy

Prepared for the Office of the Secretary of Defense

National Defense Research Institute

PREFACE

This report presents estimates, for the period from 1994 through 2015, of certain key economic and military trends in Asia that will affect the region's future security environment. Employing a common methodology, separate estimates were made for China and Taiwan by K. C. Yeh; the United States by Michael Kennedy; Japan by Charles Wolf, Jr.; Korea by Donald P. Henry; and India by Anil Bamezai. The methodology and structure of the report follows closely on those reported in earlier RAND work (Charles Wolf, Jr., Gregory Hildebrandt, Michael Kennedy, Donald P. Henry, Katsuaki Terasawa, K. C. Yeh, Benjamin Zycher, Anil Bamezai, and Toshiya Hayashi, *Long-Term Economic and Military Trends, 1950–2010*, Santa Monica, Calif.: RAND, N-2757-USDP, 1989).

The research reported here is part of RAND's project on *Long-Term Trends and the Future Security Environment* for the Director of Net Assessment in the Office of the Secretary of Defense and should be of interest to those concerned with defense and foreign policy, as well as international economic policy. This research was performed in the International Security and Defense Policy Center within RAND's National Defense Research Institute, a federally funded research and development center sponsored by the Office of the Secretary of Defense, the Joint Staff, and the defense agencies.

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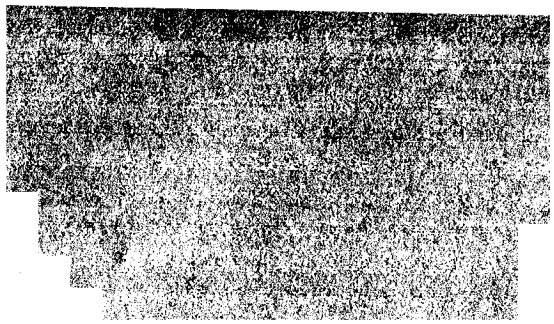

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SUMMARY

The analysis presented in this report estimates trends from 1994 through 2015 using four salient economic and military indicators for five Asian countries (China, Japan, Korea, Taiwan, and India), as well as the United States. The four indicators are gross domestic product (GDP), per-capita GDP, military spending, and military capital stocks. Trends in these indicators, among many others, may reflect significant changes in the security environment in Asia. All of the estimates should be treated with caution because of the many uncertainties, as well as the often arguable assumptions, that underlie the results.

The forecasts of economic and military trends are based on a hierarchically linked model in which GDP is derived from an aggregate national production function for each country; per-capita GDP is calculated by combining the GDP estimates with demographic data for each country; military spending is estimated as a specified (sometimes varying) proportion of GDP; and each country's military capital is estimated as a specified (sometimes varying) proportion of military spending less depreciation of the previously accumulated military capital stock.

All of our estimates are made in purchasing-power-parity (ppp) 1994 dollars. The appendix includes a discussion of the advantages and disadvantages of ppp exchange rates and the reasons for our use of this conversion procedure.

TRENDS IN GDP

Based on calculations and judgments about future inputs of capital and labor, and changes in factor productivity, we estimate that the annual rate of growth in GDP in the United States will average 2.2 percent over the 1994–2015 period. In 1994 dollars, U.S. GDP is 6.7 trillion in 1994 and will reach an estimated level of 10.7 trillion in 2015.

Japan's rate of growth is estimated at 2.6 percent annually over this period. The ratio between the Japanese and U.S. GDPs changes slightly, with Japan's GDP rising during this period from 39 to 42 percent of that of the United States.

In calculating China's GDP, two alternative scenarios were used: (1) a "disrupted-growth" scenario, resulting in an average annual growth of 3 percent in China's GDP over the period, and (2) a "stable-growth" scenario, resulting in an average annual GDP growth of 4.9 percent over the 1994–2015 period. In the disrupted-growth scenario, China's GDP rises from a 1994 level of $4.9 trillion in purchasing power parity (ppp) dollar equivalents, to a level of $9 trillion in 2015. In the stable-growth scenario, China's GDP rises from nearly $5 trillion in 1994 to $13.6 trillion in 2015; the latter figure would be approximately 27 percent above that of the United States in that year.

In both China scenarios, the ppp exchange rates that we use are at the high end of rates used by others—for example, the ppp rates used in some World Bank calculations are about half the rates we use. While we recognize the imprecision of all these rates, the reasons that seem to us to justify the ones used in this study are explained in some detail in the appendix.

In estimating GDP for Korea, growth simulations have been based on three scenarios, each involving the arbitrary (and admittedly unrealistic) assumption that reunification occurs in 1995: (1) a "soft-landing" scenario, in which reunification occurs through a peaceful, stable, and mutually accommodating process, resulting in a sustained and high growth rate of 7.9 percent annually; (2) reunification accomplished along lines of the German experience in 1990, in which GDP growth rates are somewhat lower in the initial years but rise thereafter; (3) reunification by war, in which initial growth is negative but rapidly rises in the ensuing years, so that by the second decade of the 21st century, the GDP is approximately the same as that reached in the two preceding scenarios ($2.0 trillion in 1994 ppp dollars). If reunification occurs at a later date—a more realistic premise—we expect that the growth trajectories associated with the three scenarios would still ensue, although their starting point would differ from that posited in our calculations.

Taiwan's GDP, starting at a level of $285 billion in 1994, is estimated to rise by 2015 to $860 billion, at which time its GDP is nearly 10 percent of China's disrupted-growth GDP, but only 6 percent of China's stable-growth GDP. During this period, Taiwan's average annual rate of growth is estimated at 5.4 percent.

India's economy is estimated to maintain a steady and high annual growth rate averaging 5.5 percent over the two decades, assuming that economic liberalization continues. Its GDP is estimated to rise from a level of $1.2 trillion in 1994 to $3.7 trillion in 2015, representing an increase in its GDP from about 46 percent of that of Japan in 1994 to approximately 82 percent by 2015, and from 24 percent of China's GDP in 1994 to 27 percent in 2015.

GDP PER CAPITA

Combining our GDP trend estimates with demographic figures for each country yields several interesting results. The per-capita GDPs of Japan and Taiwan are approximately equal to that of the United States by 2015, ($34 thousand), while Korea's per-capita GDP reaches two-thirds of this level. The per-capita GDP of China rises from 20 percent of that of Japan in 1994 to 30 percent in 2015 under the stable-growth scenario, while remaining at 20 percent of that of Japan in the disrupted-growth scenario. India's per-capita GDP in 2015 reaches only about 70 percent of that of China's per-capita GDP in 1994.

MILITARY SPENDING

In estimating military spending for the United States, we assume that the share of military spending of GDP declines from 4 percent to 3 percent by 1998, in accord with the military spending shares esti-

mated in the *Economic Report of the President, 1994*. Thereafter, we assume the 3 percent share is maintained through 2015. Under these assumptions, military spending in the United States declines from 1994 until 2000 and slowly rises thereafter. As the U.S. GDP grows, military spending falls from its present level of $290 billion to $235 billion in 2000, rising thereafter to $322 billion in 2015.

Two alternative military spending estimates are made for Japan: one in which the military spending share of GDP remains at 1 percent and the second in which that share rises to 3 percent. Accordingly, Japan's military spending rises from its present level to about $45 billion in 2015, and $135 billion in 2015, respectively for the two scenarios. Japan's military spending remains substantially below that of the United States in both the 3 percent and 1 percent scenarios.

China's military spending remains below that of the United States through 2015 in the disrupted-growth scenario, but rises above U.S. military spending by 2006 and thereafter, in the stable-growth scenario.

Taiwan's military spending, currently 9 percent of China's, remains at that proportion if China experiences stable growth; if China's growth is disrupted, Taiwan's military spending rises to twice that proportion.

Korea's military spending, currently somewhat below that of Japan ($20 billion versus $26 billion for Japan in 1994 ppp dollars), approximates that of Japan by the year 2000 and exceeds that of Japan thereafter if Japan's military spending share remains at 1 percent of its GDP. If Japan's military spending increases to 3 percent of its GDP, the resulting military spending appreciably exceeds that of Korea throughout the 1994–2015 period.

India's military spending, currently about $42 billion, reaches a regionally significant scale of $148 billion by 2015, representing over 40 percent of China's military spending in its disrupted-growth scenario, and about 23 percent of China's higher military spending in the stable-growth scenario.

MILITARY CAPITAL STOCKS

For the United States, the value of military capital falls over the 1994–2015 period, because additions to U.S. military capital stocks through procurement and construction are less than the depreciation of previously accumulated stocks. Consequently, the present U.S. military capital stock of $1.1 trillion in 1994 is estimated to fall to about $840 billion by 2015.

Japan's military capital stock increases from 9 percent of that of the United States in 1994 to nearly 20 percent in 2015 if Japan's military spending share remains at 1 percent, and to over half that of the United States by 2015 if Japan's annual military spending share of GDP rises to 3 percent.

Korea's military capital in 2015 remains about 80 percent of Japan's in the latter's 1 percent military spending scenario, falling well below that of Japan in relative terms if Japan increases its military spending to 3 percent of its GDP.

China's military capital becomes dominant in the region and reaches a level at about 55 percent of the U.S. level in 2015 in China's stable-growth scenario, and 37 percent of that of the United States in the disrupted-growth scenario. However, within the Asian region, India may exercise a counterweight to China's apparent dominance. India's military capital rises substantially relative to that of China, reaching by 2015 about 77 percent of China's military capital in the stable-growth scenario, and slightly exceeding that of China in the latter's disrupted-growth scenario.

According to our estimates, Taiwan's military capital increases modestly relative to that of China.

CONCLUDING OBSERVATIONS

Many uncertainties surround our forecasts: uncertainties related to the models we have used, the individual country data and their comparability across countries, and neglect of the possible changes that might ensue in the behavior of countries and their decisionmakers if some of the forecasted trends actually unfold. Paradoxically, some of the forecasts—especially for the later years—might turn out to be

wrong because other forecasts—especially for the earlier years—were accurate. For example, if China's military spending and military capital were to move toward the large and perhaps alarming scale of our estimates, the military spending and procurement decisions by other countries, including the United States, might change substantially. In turn, China's anticipation of such a response might exercise downward pressure on its own military allocations. In this sense, our forecasts might turn out to be "self-preventing," rather than "self-fulfilling."

Still other uncertainties are associated with the possible occurrence of major exogenous events—for example, military conflicts or the forging or fracturing of alliances—that might alter the behavior of decisionmakers and the performance of economies.

Another important uncertainty arises from the extent to which the countries for which we have made forecasts might use the noncapital shares (70–75 percent) of their military spending to enhance military effectiveness by innovative changes in military technology, organization, and operations. These issues, which pertain to a revolution in military affairs, are not addressed in this study.

While we acknowledge the numerous uncertainties that apply to our estimates, several inferences can be drawn from them that are relevant to the future security environment in Asia.

1. The long-term trends projected here probably foreshadow over the next two decades a tremendous growth of both economic and military power in the Asian region relative to that in the rest of the world.
2. Within the Asian region, the parities among the Asian countries will change significantly, and the disparities among them will grow, both in economic and military terms. China's aggregate economic as well as military capabilities will grow significantly relative to most of the other countries in the region, except India. Yet, the economic well-being of China's populace (as crudely measured by per-capita GDP) will remain substantially below that of most other countries in the region, again with the exception of India.

3. Korea's economic capabilities are likely to grow relative to thc of Japan, as will its relative military strength unless Japan creases its military efforts.
4. India is likely to become a more significant actor in the region, both economic and military terms, and will probably increase both dimensions relative to China.
5. The economic and military prominence of the United States remain throughout the region, although its relative scale a scope will diminish.
6. Finally, it remains to be seen whether and how these change the relative scale and influence of the *national* actors in the reg will be modified or channeled by contemporaneous *transnatio* trends—for example, trends in international security alliances international business alliances, and in transnational infor tional and occupational communication and transactions. S transnational trends have not been considered in the work scribed here.